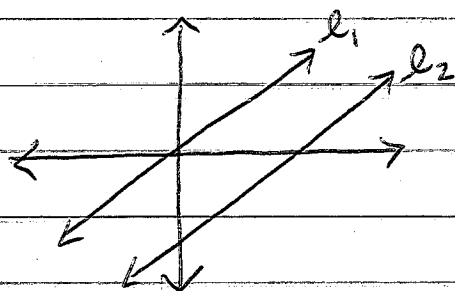


2.2 PARALLEL AND PERPENDICULAR LINES

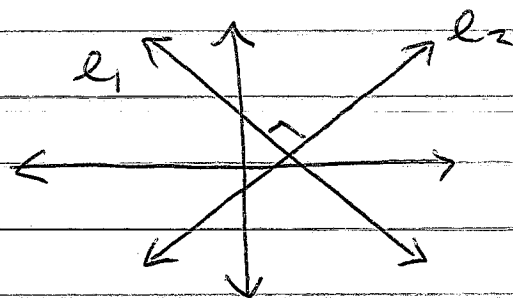
PARALLEL - two lines in a plane that never intersect.

Perpendicular lines - two lines in a plane that intersect to form a right angle.



The lines are parallel iff they have the same slope.

$$m_1 = m_2$$



The lines are perpendicular iff their slopes are negative reciprocals of each other.

$$m_1 = -\frac{1}{m_2} \text{ or}$$

$$m_1 \cdot m_2 = -1$$

Tell whether the lines are parallel, perpendicular, or neither.

Ex 1: LINE 1: $(-2, 3) \frac{1}{3} (5, 9)$

LINE 2: $(-7, -6) \frac{1}{3} (7, 6)$

$$m_1 = \frac{9-3}{5-(-2)} = \frac{6}{7}$$

$$m_2 = \frac{6-(-6)}{7-(-7)} = \frac{12}{14} = \frac{6}{7}$$

parallel since $m_1 = m_2$

Ex 2: LINE 1: $(0, 1) \frac{1}{3} (2, 6)$

LINE 2: $(-6, -4) \frac{1}{3} (-31, 6)$

$$m_1 = \frac{6-1}{2-0} = \frac{5}{2}$$

$$m_2 = \frac{6-(-4)}{-31-(-6)} = \frac{10}{-25} = -\frac{2}{5}$$

perpendicular

$$\text{since } \frac{5}{2} \cdot \left(-\frac{2}{5}\right) = \frac{-10}{10} = -1$$

Homework: p. 79 #12-15, 41-44, 49